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【Document Name】 Specification

【Title of the Invention】 Image Data Transmitting Device and Method

【Scope of the Patent Claims】

【Claim 1】 An image data transmitting device, comprising:

5 a communication device that transmits main image data stored in a storage medium to other communication apparatus; and

an information processing device that deletes the transmitted main image data stored in the storage medium after the communication device transmits the main image data stored in the storage medium to other communication apparatus, produces
10 a reduced image of the main image to be stored in the storage medium, or keeps the reduced image data of the main image data stored in the storage medium.

【Claim 2】 The image data transmitting device as defined in claim 1, further comprising:

15 a first setting device with which a user sets erasure after transmission of individual main image data stored in the storage medium,

wherein the information processing device does not delete the main image stored in the storage medium after transmitting the main image that has not been set erasure by the first setting device to other communication apparatus, and deletes the transmitted main image data stored in the storage medium after transmitting the main
20 image that has been set erasure by the first setting device to other communication apparatus.

【Claim 3】 The image data transmitting device as defined in claim 1 or 2, further comprising:

25 a second setting device with which the user sets a communication apparatus of the main image stored in the storage medium to be transmitted,

wherein the communication device transmits the main image to the communication apparatus set with the second setting device.

【Claim 4】 The image data transmitting device as defined in claim 1 ,2 or 3, wherein the communication device automatically transmits the main image data to be transmitted stored in the storage medium to other communication apparatus when the communication device becomes able to communicate with other communication apparatus.

【Claim 5】 The image data transmitting device as defined in one of claims 1 to 4, wherein the information processing device adds an indicator indicating that the main image data has been transmitted to a file name of a file storing the information of the transmitted main image data.

【Claim 6】 The image data transmitting device as defined in one of claims 1 to 5, wherein the information processing device shows information indicating that the transmission is completed on a file that the information of the transmitted main image is stored, as attached information.

【Claim 7】 The image data transmitting device as defined in one of claims 1 to 6, wherein the information processing device shows at least one of picture information, color information, frame information or texts as information indicating that the transmission is completed onto the reduced image of the transmitted main image.

【Claim 8】 The image data transmitting device as defined in one of claims 1 to 7, wherein the information processing device shows at least one of picture information, color information, frame information and texts as information indicating the destination to where the image is to be transmitted onto the reduced image of the transmitted main image.

【Claim 9】 The image data transmitting device as defined in one of claims 5 to 8, further comprising:

a first display that identifiably displays a reduced image based on at least one of information that the main image data stored in the storage medium has been transmitted, indicator, or information indicating where the image is to be transmitted.

【Claim 10】 The image data transmitting device as defined in one of claims 5 to 9, further comprising:

a third setting device setting the reception of the transmitted main image data according to the information of the reduced image data stored in the storage medium,

5 wherein the communication device receives the main image data that has been selected and set from other communication apparatus, and stores the main image data in the storage medium.

【Claim 11】 The image data transmitting device as defined in claim 10, wherein the information processing device replaces the information that transmission of the main image data is completed, indicator, and information indicating where to be transmitted with the information before the main image data is transmitted when the transmitted main image data is received from other communication apparatus and stored in the storage medium.

【Claim 12】 The image data transmitting device as defined in one of claims 1 to 11, further comprising:

a fourth setting device setting transmission of one, a plurality of, or all of the main image data stored in the storage medium to other communication apparatus,

wherein the information processing device produces a transmission information file that shows setting information set with the fourth setting device, and

20 wherein the communication device transmits the main image data stored in the storage medium to the predetermined other communication apparatus according to the information shown in the transmission information file.

【Claim 13】 The image data transmitting device as defined in one of claims 1 to 12, further comprising:

25 a second display that displays a message that the main image data is being transmitted while the communication device is transmitting the main image data stored in the storage medium to other communication apparatus.

【Claim 14】The image data transmitting device as defined in one of claims 1 to 13, further comprising:

an imaging device that captures the subject image,
wherein the captured main image data is stored in the storage medium.

5 【Claim 15】 An image data transmitting method, comprising the steps of:

transmitting main image data stored in a storage medium to other
communication apparatus; and

deleting the transmitted main image data stored in the storage medium after
the main image data is transmitted, while producing reduced image of the main image
10 and storing it in the storage medium or keeping reduced image data of the main
image data stored.

【Claim 16】 The image data transmitting method as defined in claim 15, further
comprising the steps of:

15 setting erasure after transmission of each of the main image data stored in the
storage medium in accordance with an operation by a user;

not deleting the main image stored in the storage medium after transmission
of the main image that has not been set erasure by the user to other communication
apparatus, and deleting the transmitted main image data stored in the storage medium
after transmission of the main image that has been set erasure by the user to other
20 communication apparatus.

【Claim 17】 The image data transmitting method as defined in one of claims 15 or
16, wherein the user sets a communication apparatus for the main image stored in the
storage medium to be transmitted, and transmits the main image to the
communication apparatus set by the user.

25 【Claim 18】 The image data transmitting method as defined in one of claims 15,
16 or 17, wherein the main image data to be transmitted stored in the storage medium
is automatically transmitted to other communication apparatus when communication

with other communication apparatus becomes able.

【Claim 19】 The image data transmitting method as defined in one of claims 15 to 18, wherein an indicator is added to a file name of a file storing information of the transmitted main image data.

5 【Claim 20】 The image data transmitting method as defined in one of claims 15 to 19, wherein showing information indicating that the transmission is completed onto the file that the information of transmitted main image is stored, as attached information.

10 【Claim 21】 The image data transmitting method as defined in one of claims 15 to 20, further showing at least one of picture information, color information, frame information or texts as information indicating that the transmission is completed onto the reduced image of the transmitted main image.

15 【Claim 22】 The image data transmitting method as defined in one of claims 15 to 21, further showing at least one of picture information, color information, frame information or texts as information indicating the destination to where the image to be transmitted onto the reduced image of the transmitted main image.

20 【Claim 23】 The image data transmitting method as defined in one of claims 19 to 22, wherein identifiably displaying reduced image based on at least one of the information indicating that the transmission of main image stored in the storage medium is completed, indicator, or information indicating where to be transmitted.

 【Claim 24】 The image data transmitting method as defined in one of claims 19 to 23, wherein:

 the user selects and sets the reception of the transmitted main image data according to the reduced image data stored in the storage medium; and

25 the selected and set main image is received from other communication apparatus; and the received main image is stored in the storage medium.

 【Claim 25】 The image data transmitting method as defined in claim 24, wherein

the information that transmission of the main image data is completed, indicator, and information indicating where to be transmitted is replaced with the information before the main image data is transmitted, when the transmitted main image data is received from other communication apparatus and stored in the storage medium.

5 【Claim 26】 The image data transmitting method as defined in one of claims 15 to 25, wherein:

the user sets transmission of one, a plurality of, or all main image data stored in the storage medium to other communication apparatus;

producing a transmission information file showing setting information; and

10 transmitting the main image data stored in the storage medium to predetermined other communication apparatus according to the information shown in the transmission information file.

 【Claim 27】 The image data transmitting method as defined in one of claims 15 to 26, wherein a message that the main image data is being transmitted is displayed on a display while the communication device transmits main image data stored in the storage medium to other communication apparatus.

15 【Detailed Description of the Invention】

 【0001】

 【Field of the Invention】

20 The present invention relates to an image data transmitting device and an image data transmitting method, and more particularly to an image data transmitting device that transmits main image data to other communication apparatus, and an image data transmitting method.

 【0002】

25 【Prior Art】

Japanese Patent Application Laid-Open No. 9-37125 discloses a camera that temporarily stores image data captured electronically in a storage device and

transmits the image data to other apparatus. This camera can capture the image data when a power switch is on, and it can transmit the image data only when the power switch is off.

【0003】

5 【Problem to be Solved by the Invention】

However, the conventional camera shown in Japanese Patent Application Laid-Open No. 9-37125 transmits the image data as long as a battery is not exhausted. In addition, in case of deleting the transmitted images stored in the camera after transmitting them, the history of the transmitted image data are not kept in the camera,
10 which was a problem for the user not being able to recognize the transmitted main image.

【0004】

The present invention has been achieved in view of these circumstances and it is an object of the present invention to provide an image data transmitting device and
15 method in which a user can easily recognize main image after the image data has been transmitted by keeping the reduced image data of the image that has been transmitted from image transmitting device to other communication apparatus on the image transmitting device side.

【0005】

20 【Means for Solving Problem】

For attaining the above described objects, the present invention is directed to an image data transmitting device, comprising: a communication device that transmits main image data stored in a storage medium to other communication apparatus; and an information processing device that deletes the transmitted main image data stored
25 in the storage medium after the communication device transmits the main image data stored in the storage medium to other communication apparatus, while produces reduced image of the main image and stores in the storage medium, or keeps the

reduced image data of the main image data stored in the storage medium.

【0006】

According to the present invention, the users can easily recognize the transmitted main image by comprising; a communication device that transmits main image stored
5 in the storage medium to other communication apparatus; and an information processing device wherein the communication device that deletes the transmitted main image stored in the storage medium after transmitting main image stored in the storage medium to other communication apparatus, while produces reduced image of main image and stores in the storage medium or keep the reduced image stored.

10 【0007】

【Detailed Description of the Preferred Embodiments】

A preferred embodiment according to the present invention will be described in detail hereinafter referring to the accompanying drawings.

【0008】

15 Fig. 1 is an external perspective view of an image transmitting device and an information storage device that can communicate with image data transmitting device.

【0009】

According to Fig. 1, the electronic camera 10 (image transmitting device)
20 comprises an imaging lens 12 that forms a subject image on an imaging device; a display 16 that displays a frame number 14, an image, index display of thumbnail image, a message that the camera 10 is transmitting image data, and so on; a power switch 18 for inputting the activation and stoppage of the functions of the electronic camera 10; a shutter release button 20 for user to indicate capturing an image; a mode
25 selector 22 for selecting and setting each of the operation modes within the electronic camera 10; a delete button 24 for designating a desired item to be deleted from items displayed on the display 16; a set button 26 for setting a desired item (permission to

erase information stored in a storage medium, prohibition against the erasure, etc.) displayed on the display 16; an increment button 28 for increasing the frame number or the like displayed on the display 16; and a decrement button 30 for decreasing the frame number or the like displayed on the display 16.

5 【0010】

The electronic camera 10 also has an antenna 62 that transmits and receives a carrier wave and data when transmitting and receiving information such as image data with external apparatus through communication.

 【0011】

10 The information storage device 32 can receive information transmitted from the electronic camera 10 and store it in a storage medium with a large capacity. The information storage device 32 comprises an antenna 40 that transmits and receives information; a computer 34 that has the storage medium such as a hard disc and an information processing device including a CPU; a display 36; and an input device 38
15 such as a keyboard. The information storage device 32 may store an electronic image album and so on, and it may be a printer that prints an image of received data.

 【0012】

Fig. 2 is a block diagram showing a signal processing system structure of the electronic camera.

20 【0013】

The electronic camera 10 is provided with the imaging device 42 that forms the subject image on a light-receiving surface to perform a photo-electronic conversion and outputs the converted image data, and a light-emission device 43 that emits a light to illuminate the subject. The imaging device 42 includes a focus adjusting
25 device that focuses the subject on the light-receiving surface, an aperture adjusting part that adjusts an aperture, a shutter speed adjusting device that adjusts an exposure time and a zoom adjusting device that adjusts a view angle.

【0014】

The electronic camera 10 is provided with an information processing device 44 that controls the entire camera 10, and controls the sampling timing of image data, the light-emission device 43, the exposure including the aperture and shutter speed, the focus, the zoom, white balance, storage of image data, communication and display, conversion of the number of pixels of an image data, various conversion processing of image data, setting or canceling of a power save mode, instructions for the storage medium 54 to store or delete information, and instructions for a storage medium interface 56 to permit or prohibit deleting a file stored in the storage medium 54.

【0015】

A memory 58 is connected to the information processing device 44, and the memory 58 is composed of a ROM that stores operation programs for the electronic camera 10, various constants, parameters indicating imaging conditions and parameter indicating properties of images, and so on, and a RAM which is a storage device for operation area while the programs are executed.

【0016】

Further, the electronic camera 10 is provided with an image processing device 46 that performs changing of the number of pixels, sharpness correction, gamma correction, contrast correction, white balance correction, etc.; a frame memory 48 that temporarily stores image data; an input device 50 including the shutter release button 20, the deleting button 24, the set button 26, the increment button 28, the decrement button 30; and a compressing and decompressing device 52 that compresses information such as image data in a format including the JPEG and MPEG and decompresses the compressed data in accordance with instructions of the information processing device 44.

【0017】

The electronic camera 10 also has the storage medium interface 56 that converts information and image data to be stored or read in/from a detachable storage medium 54 and at the same time stores information on whether to permit or prohibit erasure of the information stored in the storage medium 54 in a predetermined area of the storage medium 54. The detachable storage medium 54 is a memory card, an MO or the like, that uses semiconductors, magnetic recording and optical recording.

【0018】

A wireless communication device of the electronic camera 10 that communicates for transmitting and receiving image data with other communication apparatus, comprises; a transmitting and receiving device 60 (communication device) that encodes data before transmitting it or decodes data after receiving it in accordance with instructions of the information processing device 44, the antenna 62 for transmitting and receiving the carrier wave and the data, and a communication connector 64 for connecting each of the communication apparatus through a cable to perform wire communication.

【0019】

Information stored in the storage medium 54, the RAM, the ROM and the frame memory 48 can be transmitted to other communication apparatus through the communication device, and information can be received from other communication apparatus through the communication device to be stored in them. A light such as an infrared light may be used for the wireless communication instead of the radio wave, and the wire communication may be performed with the cable connected to each apparatus.

【0020】

In case of transmitting and receiving with other communication apparatus through connector 64, the information is converted into electric signals or optical signals, which is transmitted through the cable connected between each apparatus carrying

out transmission and reception of information.

【0021】

Furthermore, the electronic camera 10 is provided with a display 16 that displays the message that the information is being transmitted to other communication apparatus, the main image and reduced image; a D/A converter 66 that converts data
5 displayed in the display; a character generator 68 that converts code information from the information processing device 44 into data of texts or messages to be displayed; and a calendar and clock 70 that shows the date and time.

【0022】

10 The imaging processing of the electronic camera 10 configured as above, will now be explained with reference to a flowchart in Fig. 3 about a signal processing of a captured image.

【0023】

The subject image captured is formed on the light-receiving surface of the imaging
15 device 42, and the formed subject image is photo-electrically converted to be outputted to image processing device 46. The resultant image data goes through processes of amplifying and noise reduction at image processing device 46, and temporarily stored in the frame memory 48. The information processing device 44 sequentially transfers the image data stored in the frame memory 48 to D/A converter
20 66, and displays on the display 16.

【0024】

When the user pushes the shutter release button 20 of the input device 50 or instructs to capture the image through the communication device, the processing program for the information processing device 44 goes to step S100 of “START” of
25 the program flow shown in Fig. 3 (hereinafter these will be abbreviated as e.g. S100). Then, the processing program of the information processing device 44 goes to S102 of “SHOOTING” to perform shooting under designated exposure conditions,

light-emission conditions, zooming conditions and focusing conditions and photo-electrically convert the subject image formed on the light-receiving surface of the imaging device 42 into the image data.

【0025】

5 The inputted image data undergo amplifying, noise reduction, white balance adjustment and converting the resolution/number of pixels in regards to the image signal outputted from the imaging device 42 to image processing device 46. Then, the processed image data is temporarily stored in the frame memory 48.

【0026】

10 At S104 of “TRANSMIT?,” whether a mode for transmitting the image data to other communication apparatus has been selected or a mode for storing the image data in the storage medium 54 of the electronic camera 10 is determined. If a mode for storing the image data in the storage medium 54 has been selected, then the program goes to S106 of “COMPRESSION.”

15 【0027】

At S106, the image data is transmitted from the frame memory 48 to the compressing and decompressing device 52, which compresses the image data in predetermined number of pixels, compression rate, and color information with a predetermined compression method. The compressed image data is transmitted to
20 the storage medium interface 56 and stored in the storage medium 54 at S108 of “STORE IMAGE FILE IN STORAGE MEDIUM.” Then, the program goes to S110 of “END” to finish the processing. Tag information such as shooting date and time, the shooting mode, the title, and reduced image data (thumbnail data) may be stored in an image file with the main image data.

25 【0028】

Additionally, the information processing device 44 instructs emission amount against emission device 43 according to predetermined shooting conditions, while

instructing emission timing. Under certain shooting conditions, the imaging may be carried out with a preliminarily set zooming and focus positions.

【0029】

If the mode for storing the image in the storage medium has not been selected at S104, then the processing program goes to S112 of “COMPRESSION AND TRANSMISSION.” At S112, the image data stored in the frame memory 48 is transmitted to the compressing and decompressing device 52, which compresses the image data in the predetermined number of pixels, compression rate, and color information with predetermined compression method. The compressed image data is transmitted to the transmitting and receiving device 60. The image information (including main image) outputted from transmitting and receiving device 60 is transmitted to information storage device 32 via antenna 62 or communication connector 64.

【0030】

During the transmission, the display may display the information of the communication apparatus to be transmitted to and image file information being transmitted to notify the user. Since an image file is generally large, the transmission takes several minutes to tens of minutes. If any message is not displayed during that time, the user can mistakenly turn off the power switch or cut the communication. The message prevents such mistakes.

【0031】

Information storage device (server) 32 stores the image file received via antenna 40 in the storage medium such as the hard disc in the computer 34. After all the image information has been transmitted, at S116 of “STORE THUMBNAIL DATA IN STORAGE MEDIUM,” the reduced image (which is called thumbnail data) of the transmitted image is produced and stored in the storage medium 54. Information (texts or characters) that indicates the image file has been transmitted is added to the

thumbnail. An indicator indicating to where it has been transmitted and that it has been transmitted may be added to the file name or image file.

【0032】

The thumbnail data are reduced images which have, for example, 160×120 pixels.

5 In case the thumbnail data has been stored in 1thIFD (Image File Directory) of the image file preliminarily including main image (for example, in the Exif format that is widely used for electronic cameras in these days), only the main image data with large capacity may be deleted to keep the thumbnail data. In case of deleting only the main image data, comments that main image are deleted may be added to

10 maker-note tag or user comment tag and so on of the image file directory of the image file for identification. Also, thumbnail image data may be stored in the 0thIFD instead of deleted main image data.

【0033】

After the thumbnail data is stored in the storage medium 54, the processing

15 program of the electric camera 10 goes to S110 of “END” to finish the processing routine of photographing.

【0034】

When the image data captured is to be transmitted manually to other communication apparatus, image data is captured by setting, for example, the mode

20 selector 22 into a transmission mode. Then, the user pushes a transmission button of the inputting device 50 after capturing has finished, and the information processing device 44 sequentially reads the designated image data from the storage medium 54 or the frame memory 48. The information processing device 44 convert the image data into predetermined data format, and the transmitting and receiving device 60

25 transmits the converted data to the external apparatus through the antenna 62 or the communication connector 64.

【0035】

When image data stored in the storage medium 54 is to be transmitted to the information storage device 32 automatically, an automatic transmission mode is preliminarily set for the mode selector 22. When the electronic camera 10 (image transmitting apparatus) and the information storage apparatus 32 get into a communication area, they automatically start the image transmitting process.

【0036】

Fig. 4 is a flowchart showing image selection and image processing.

【0037】

When an image is to be selected to receive, transmit or reproduce the image data stored in the storage medium 54 or in other communication apparatus (information storage apparatus 32 etc.), the user selects an image selection mode of the mode selector 22. Then, the processing program of the information processing device 44 goes to step S200 of “START” shown in the program flow of Fig. 4.

【0038】

Next, the processing program 44 goes to S202 of “SELECT IMAGE,” information on the image files stored in the storage medium 54, the information on transmitted image files, and image file information stored in other communication apparatuses that can communicate are displayed on the display. The image file information may be an image file list with texts, or it may be an index displaying thumbnails recorded in the image files as shown in Fig. 5.

【0039】

Fig. 5 shows an embodiment of index display that is displayed on display 16.

【0040】

According to Fig. 5, on the index display 80, the thumbnails 82 of each image, transmission information 84 indicated by marks “TRANSMITTED,” “PRINTED,” “HARD DISC,” “STORAGE MEDIUM,” and “RECEIVED” on the thumbnails 82 that indicate where the main image data is stored or where it has been transmitted to,

and selection information 86 indicating that the user have chosen by changing the frames of the thumbnails 82. Transmission information 84 may be displayed by characters, texts, image frame colors or shapes to be identifiable.

【0041】

5 At S202, the user selects one or more desired image files with reference to the index display 80 on the display 16 with the input device 50. Then, the processing program of the information processing device 44 goes to S204 of “IMAGE DATA IS IN STORAGE MEDIUM?” If the image data selected by the user is not the image stored in the storage medium of the electronic camera 10, then the program goes to
10 S206 of “RECEIVE IMAGE DATA?”

【0042】

If the user selects two or more image files at S202, transmission information file with setting information set by the setting device may be produced for the subsequent processing based on the information in the transmission information file.

15 【0043】

Fig. 6 shows the contents in the transmission information file.

【0044】

If the user set plurality of files to be transmitted stored in the storage medium 54, the information processing device 44 produces transmission information file shown
20 in Fig. 6.

【0045】

The transmission information file 88 that has been produced as above, indicates general information including version information of the transmission file 88, information on the image transmitting device, and the date and time of the
25 production; user information including name, address, telephone number, etc. of the user; print job information including a product ID, the number of prints, the print size, and the information on an index print; image source information including a

recording format for the image files, and image source file names; various setting information including letters (the date, the title, etc.) to be printed on the prints, and information on trimming and printing direction; individual manufacturer function information including names of the files to be deleted from the storage medium after the transmission, and the name, the manufacturer and the serial number of the communication apparatus to which the image files are to be transmitted etc. The information processing device 44 reads the transmission information file 88A, and transmits the files to be transmitted to the predetermined destination in an order. The transmission information file 88 may be deleted when the transmission or displaying of images is finished, and it may be stored in the predetermined directory of the storage medium 54.

【0046】

At S206, it is determined whether or not the transmission is able with the designated other communication apparatus and whether or not the reception of image is started. In case of receiving image information, the information storage device 32 is informed of the image file name to be received at S208 of "ACCESS SERVER." Furthermore, subsequent process may be carried out by establishing communication with a process of newly searching the information storage device 32.

【0047】

Then, at S210 of "RECEIVE IMAGE FILES," the electronic camera 10 receives the image information from the information storage apparatus 32 through the antenna 62 and the transmitting and receiving device 60. The electronic camera 10 stores the received image data in the storage medium 54, and decompresses the compressed image data compressed with predetermined compression method with the compressing and decompressing device 52 and temporarily stores the decompressed image data in the frame memory 48. The image data now stored in the frame memory is then transmitted to the D/A converter 66, and the desired main image is displayed

on the display 16. The display 16 may display a message that the image file is being received from other communication apparatus at S210 to notify the user. The transmission information 84 that the image file has been received is written and stored in the thumbnail data of the received image file. An indicator and information
5 indicating that the image is a received image, or information indicating the receiving device may be added into the image file name and in the image file. If a once transmitted main image is received and stored in the storage medium 54 again, the information indicating that the image file has been transmitted, indicator, and information indicating where the image file to be transmitted all shown in the image
10 file, may be replaced by the original condition before the transmission.

【0048】

Next, at S212 of “INFORMATION INDICATING THAT THE IMAGE FILE HAS BEEN STORED,” the information processing device 44 writes information indicating that the image file has been stored in the storage medium 54 to the attached
15 information of the image file. After that, the program goes to S214 of “RETURN TO IMAGE SELECTION SCREEN.” If the user does not want to receive the image file at S206, the program goes to S214.

【0049】

If the image selected in S204 was the image stored in the storage medium of the
20 electronic camera 10, the program goes to S216 of “REPRODUCE MAIN IMAGE?” If the user sets to reproduce the main image in S216, the program goes to S218 of “REPRODUCE MAIN IMAGE.”

【0050】

Fig. 7 shows a menu screen on which the user directs reproduction of the main
25 image.

【0051】

According to Fig. 7, on the menu screen 90, modes “PRINTER A,”

“REPRODUCE MAIN IMAGE,” “TRANSMIT IMAGE DATA,” and “RETURN.”

In the mode “PRINTER A,” image data is transmitted to a printer A to print the main image with the printer A. In the mode “REPRODUCE MAIN IMAGE,” the main image is reproduced. In the mode “TRANSMIT IMAGE DATA,” the image data is transmitted to other communication apparatus. In the mode “RETURN,” the index display screen is displayed again. The user moves a cursor 92 to select one of the desired processes and sets the communication apparatus to be transmitted to.

5 【0052】

If the user selects the mode “REPRODUCE MAIN IMAGE” at S218, the storage medium interface 56 reads desired image data from the storage medium 54, and the compressing and decompressing device 52 decompresses the compressed image data compressed with a predetermined compression method, and the decompressed image data is temporarily stored in the frame memory 48.

The image data stored in the frame memory 48 is transmitted to the D/A converter 66, and the desired main image is displayed on the display 16. Then, the program goes to step S214. Fig. 8 shows the main image 94 that is reproduced and displayed on the display 16.

10 【0053】

If the user does not set to reproduce the main image at S216, the program goes to S220 of “TRANSMIT IMAGE FILE?” If the user sets to transmit the image stored in the storage medium 54 to a desired communication apparatus such as information storage apparatus 32, the program goes to S222 of “TRANSMIT IMAGE FILE.” At S222, it starts communicating with the communication apparatus set by the user while starting to transmit designated image file. At this time, the display 16 displays a message that the image file is being transmitted to other communication apparatus to notify the user.

15 【0054】

After the transmission of image file, at S224 of "INFORMATION THAT IMAGE FILE HAS BEEN TRANSMITTED," the information processing device 44 writes information indicating that the image file has been transmitted to the attached information of the transmitted image file stored in the storage medium 54, and goes to S214 "RETURN TO IMAGE SELECTION SCREEN". If the user has set erasure of the main image data stored in the storage medium 54, the main image data set is deleted and the thumbnail data is kept after the transmission.

【0055】

Then predetermined transmitting information 84 is written and saved in the thumbnail image. On the contrary, as for image file which the user has not set erasure after transmission against the image information stored in the storage medium 54 (or image file set with write-protect), main image of the set image is not deleted but kept while writing and saving predetermined transmitting information 84 into thumbnail image. An indicator or information indicating that the image file has been transmitted may be added to the image file name and into the image file. If the user does not want to transmit the image file at S220 (by selecting "RETURN"), then the program goes to S214.

【0056】

At S214, it is processed to return the displaying on the display into the screen of the original index display 80, and the program goes to S226 of "NEXT IMAGE?" At S226, it is determined whether there are any images selected in S202 have not finished being transmitted, received or displayed. If any of the images has not been finished being dealt with, the program goes to S228 of "NEXT IMAGE", and if all the selected images have been dealt with at S226, the program goes to S230 of "END" to finish the processing routine of selecting images. Also at S228, it goes to the next image file and executes process to return to S204.

【0057】

Fig. 9 shows a structural example of an image file.

【0058】

According to Fig. 9, the image file 96 is composed of a tag information area 98 for comments such as the shooting date and time, the shooting mode, and the title; a thumbnail data area 100 for reduced image data; and a main image data area 102 for the main image data.

【0059】

If the user sets transmission of the image and image file 96 is transmitted to other communication apparatus, the information processing device 44 deletes the data of the main image data area, and at the same time the adding attached information indicating that the image file has been transmitted by changing the IFD (Image File Directory) information on the main image of the tag data area, and the transmission information 84 is added to the thumbnail data.

【0060】

Fig. 10 shows another embodiment of a transmission information file shown in Fig. 6.

【0061】

If the user sets the plurality of files to be transmitted stored in the storage medium 54, the information processing device 44 produces transmitting information file shown in Fig. 10.

【0062】

The transmission information file 88A indicates various setting information including the file names of the files to be transmitted, information on where the image files are to be transmitted to or have been transmitted to, transmission completion information indicating that it is a file that have been transmitted, information on the number of prints of each image, and information on the print sizes. The information processing device 44 reads the transmission information file 88A,

and transmits the files to be transmitted to the predetermined destination in an order.

【0063】

【Effects of the Invention】

As mentioned above, the image data transmitting device related to the present
5 invention comprises the communication device that transmits the main image data
stored in the storage medium to other communication apparatus; and the information
processing device that deletes the transmitted main image data stored in the storage
medium after the communication device transmits it to other communication
apparatus, and produces the reduced image data of the main image data and stores it
10 in the storage medium or keeps the reduced image data stored in the storage medium.
This makes it easy for the user to recognize the image after the main image data is
transmitted.

【Brief Description of the Drawings】

【Fig. 1】

15 An external perspective views of image transmitting device and information
storage device that can communicate with image transmitting device

【Fig. 2】

A block diagram showing signal processing system of the electronic camera

【Fig. 3】

20 A flowchart showing signal processing of the electronic camera

【Fig. 4】

A flowchart showing image selection and image processing

【Fig. 5】

A diagram showing an index displayed on a display

25 【Fig. 6】

A diagram showing the contents of a transmission information file

【Fig. 7】

A diagram showing a menu screen for users to instruct reproduction of a main image

【Fig. 8】

A diagram showing the display example of the main image

5 【Fig. 9】

A diagram showing a structure of an image file

【Fig. 10】

A diagram showing another embodiment of the transmission information file

【Brief Description of the Reference Numbers】

10 10...electronic camera, 12...imaging lens, 16...display, 22...mode selector,
26...set button, 32...information storage device, 34...computer, 40...antenna,
42...imaging device, 44...information processing device, 46...image processing
device, 50...input device, 54...storage medium, 56...storage medium interface,
60...transmitting and receiving device, 62...antenna, 64...communication connector,
15 80...index display, 82...thumbnails, 84...transmission information, 86...selection
information, 88...transmission information file, 90...menu screen, 94...main image,
96...image file, 98...tag information area, 100...thumbnail data area, 102...main
image data area